MINISTRY OF
TRANSPORT & CIVIL AVIATION

The Transport of Goods by Road

Report of a Sample Survey
made in April 1958

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SYMBOLS

The following have been used throughout

.. = Not available

— = Nil or negligible

The transport of goods by road

Report of a sample survey made in April, 1958

I. INTRODUCTION

1. The amount of statistical information about the movement of goods by road is not in keeping with the importance of this means of transport in the national economy. Although there are fairly detailed statistics of the numbers and types of goods vehicles there are no regular and comprehensive measures of the employment of these vehicles or of the amount and nature of the work which they perform.

2. In order to throw light on the operation of vehicles and on the quantity of traffic which they carry the Minister of Transport and Civil Aviation decided that a survey should be conducted by means of a sample enquiry held during the week ended 27th April, 1958. The main findings of that enquiry are set out in this paper.

3. The problem of obtaining statistics of the operation of road goods vehicles and of the traffic which they are carrying is one of some difficulty. By 1948 there were about one-third of a million operators, a number which has since grown to over half a million; to collect returns from all of them would have been a major undertaking. Moreover, many operators do not appear to keep their records in a form which makes it easy to extract statistics. Hence if returns covering a lengthy period were called for a large number of operators might find it necessary to introduce new and perhaps onerous records of a kind which they would regard as being of little value for their own business purposes.

4. There were therefore strong arguments for trying to compile the statistics of traffic and operation by obtaining returns on a limited basis. A process of sampling permits estimates to be made for the whole fleet from returns collected from a carefully chosen random sample of vehicles comprising a small fraction of the total. Moreover, by confining the enquiry to one week the amount of extra record-keeping imposed on the operators of the selected vehicles was minimised.

5. A sample enquiry similar to that described in this paper was conducted during the week ended 28th September, 1952. That enquiry provided a good deal of information about goods traffic at that time, enabling estimates to be made of the total volume of work performed by the road vehicle fleet, and permitting analyses of many aspects of vehicle operation.

6. Since 1952 there has been an increase of over one quarter of a million in the goods vehicle fleet, a substantial rise in national output, a change in the structure of the industry due to denationalisation and the removal of the radius restrictions on operators of "A" and "B" licence vehicles, an increase in the speed limit for heavy goods vehicles, and a marked rise in the proportion of diesel engined vehicles. It was clear, therefore, that a further enquiry was needed.

II. ORGANISATION OF THE ENQUIRY

7. The procedures followed in the enquiry were very similar to those of 1952. The latter had given much data needed for the efficient planning of the current enquiry. It also provided experience of the sort of questions which operators could be expected to answer and of the best manner of using the existing records in the offices of the Licensing Authorities for goods vehicles to ensure a properly random selection of vehicles. Information from the 1952 enquiry showed, moreover, the smallest numbers of vehicles of the various size and licence categories which it would be necessary to include in order to obtain a reasonable degree of accuracy in the results. This permitted the enquiry to be conducted in the most economical manner possible and it is estimated that the cost of the survey was a little over £3,000.

8. The "frame" from which the vehicles to be included in the sample were selected was the Goods Vehicle Index, in which there is one sheet for each vehicle with a carriers' licence. The sheets are arranged in alphabetical order of operators' names. The Index is in twelve sections, one in each of the eleven offices of the Licensing Authorities for goods vehicles and one in the sub-Area office at Aberdeen. The officers in charge of each section were given instructions covering the methods of selection to be used and the numbers of vehicles to be selected in each "cell" of the basic stratification, that is to say each unladen weight/licence category. The basic stratification was similar to that employed in the 1952 enquiry and is used in analysing the total vehicle fleet in table 1.

9. The number of vehicles to be selected in each "cell" in each Area was proportionate to the number of vehicles in that category in the Area, so that although the sampling fraction varied between cells it was, for a given cell, constant between Areas. This ensured a proper coverage of the country; insofar as there is any genuine difference between the normal employment of a vehicle of a given unladen weight and licence category in, say, urban and rural districts, this will be duly reflected in the final results because vehicles in the two types of district will be included in their true proportions.

III. COVERAGE

10. The enquiry covered all vehicles with carriers' licences. There are four types of carriers' licence. "A" licence vehicles may be used for the carriage of goods for hire or reward and in connection with the operator's business as a carrier of goods but in general for no other purpose connected with the carriage of goods. These have been taken to include vehicles with Special "A" licences which were issued in respect of vehicles formerly owned by the British Transport Commission and disposed of under the provisions of the Transport Act, 1953. Contract "A" licence vehicles may only be used under a contract (extending over a continuous period of not less than one year) made by the holder with some person other than a carrier for the exclusive carriage of that person's goods in connection with his trade or business. The limited carriers' licence, the "B" licence, covers the use of vehicles for the carriage of goods either in connection with the trade or business carried on by the licensee or (subject to any special conditions attached to the licence) for hire or reward. The private carrier's

licence, the "C" licence, entitles the holder to use authorised vehicles for the carriage of goods in connection with any trade or business carried on by him but not for hire or reward. British Transport Commission vehicles have a licence of one of the foregoing types and are included in the tables of this Report according to the licence under which they operate.

11. It was feared that the terms "public transport" and "private transport" might be confusing in a Report of this kind owing to the difficulty of knowing whether "public transport" refers to transport by vehicles selling their services to the public and thereby plying for hire, or to transport by publicly owned vehicles. Similarly "private transport" might denote privately owned lorries operated for hire or vehicles operated under "C" licences. The obscurity becomes worse when it is remembered that many public authorities such as the British Transport Commission, the National Coal Board and Local Authorities operate "private transport" vehicles under "C" licences.

12. Accordingly the phrases "public transport" and "private transport" have been avoided: in their stead the internationally accepted terms "transport for hire" and "transport on own account" will be used. "Transport for hire" will cover work under "A" and Special "A" licences, including British Road Services and British Railways road vehicles having these types of licence. "Transport on own account" will denote the work of "C" licence vehicles. It could also be argued that this term should cover the work of Contract "A" vehicles which are, as explained above, at the exclusive disposal of one user for a long and continuous period, and hence under his close operational control. This close integration of the work of the vehicle with the other activities of the firm is probably more significant from the economic point of view than the legal ownership of the vehicle, although the owner probably regards himself as a haulier.

13. "B" licence vehicles fall between the two categories. No comprehensive information is available about how much of their work is for hire and how much on the operators' own account. For the purpose of this enquiry a small special investigation has been made which is described below and on the basis of which an apportionment is attempted.

14. The enquiry did not cover farmers' goods vehicles taxed at special rates and hence not requiring carriers' licences. At September, 1958, the latest date for which figures are available, there were 52,000 such vehicles. About 56 per cent of these are of not over two tons unladen weight and another 34 per cent from two to three tons unladen weight. If these vehicles showed the same ton mileage per vehicle per week as "C" licence vehicles of the same sizes they would add about 3 per cent to the total ton mileage performed.

15. The enquiry also excluded agricultural tractors and engines, that is vehicles taxed under Section 4(2) of the Vehicles (Excise) Act, 1949, as amended, at the rate of £2 a year. In September, 1958, there were about 414,000 of these vehicles. Generally speaking, however, vehicles licensed under these provisions are only used on the public roads to a limited extent for the conveyance of goods, and the quantities of traffic involved are not thought to be large.

16. Government owned vans and lorries are also excluded. These numbered 43,000 in September, 1958, of which 35,000 were operated by the General Post Office.

IV. THE RESPONSE TO THE ENQUIRY

17. The numbers of forms returned and used totalled 7,372. Of the forms despatched in respect of vehicles which proved to be actually in use about 98 per cent were returned. By far the greater part of the forms which were not returned had been issued in respect of vehicles which operators had sold or scrapped without notifying the Licensing Authorities. There is no reason to suppose that this has impaired the reliability of the sample.

18. Each form was carefully scrutinised before data from it was collated. Some were, however, lacking in detail or carelessly completed in certain respects and unless fuller information could be obtained from the operator concerned it was only possible to include in the final results the information which was clearly and comprehensively provided. It was sometimes necessary to make estimates or approximations. The processes of interpreting the forms and assembling the data may have given opportunities for errors of observation, but the scope for these was not large. The information given in this report is confined to that which is believed to be firmly founded and reliable when all allowances have been made for error, but it is not possible to be certain that all of the information is of an equal degree of accuracy.

19. The great majority of operators had clearly done their best to provide the information for which they had been asked, and the enquiry would have been fruitless without these efforts. Nor could it have succeeded without the helpful co-operation shown by the operators' Associations.

road motor vehicles, in which the fleet is classified according to unladen weight and type of fuel. This source, however, does not provide information about the type of carriers' licence under which vehicles operate. On the other hand the statistics at present derived from the procedures connected with the issue of carriers' licences, give analyses by unladen weight and type of carriers' licence, but no information about the kinds of fuel used (*see* table 1). Neither source gives any information about the carrying capacity of vehicles or the type of vehicle (tipper, tanker, etc.).

22. Table 2 gives some information derived from the sample enquiry about the average carrying capacity of vehicles of each unladen weight and licence group, and table 3 shows the proportions of vehicles in the sample using diesel fuel.

Table 2

Average carrying capacity

Cwts.

Unladen weight Over	Not over	"A" licence	Contract "A" licence	"B" licence	"C" licence
	12 cwts.	..	..	..	6
12 cwts.	1 ton	..	..	..	9
1 ton	2 tons	38	..	32	22
2 tons	2½ tons	68	85	71	59
2½ tons	3 tons	103	113	102	91
3 tons	5 tons	151	156	130	125
5 tons		274	260	..	219

Table 3

Proportion of vehicles in sample using diesel fuel

Per cent

Unladen weight Over	Not over	"A" licence	Contract "A" licence	"B" licence	"C" licence
	12 cwts.	..	..	..	—
12 cwts.	1 ton	..	..	..	1
1 ton	2 tons	4	..	5	3
2 tons	2½ tons	9	13	5	11
2½ tons	3 tons	40	41	25	34
3 tons	5 tons	75	79	61	66
5 tons		96	98	..	90

23. A comparison of the figures of table 3 with those of table 6 below will show that in general the greater the average weekly mileage run by a category of vehicles the greater is the proportion using diesel fuel. This is no doubt because

the greater the weekly mileage the more easily the fuel economies can counterbalance the higher initial cost of diesel engined vehicles.

24. Since the previous enquiry was conducted in September, 1952, the change to diesel fuel has been particularly marked among "C" licence and Contract "A" licence vehicles, and the use of diesel engined vehicles has increased rapidly among the medium sized vehicles.

Table 4

Proportion of vehicles using diesel fuel in the sample enquiries of 1952 and 1958

Per cent

Unladen weight		Contract "A" licence		"C" licence	
Over	Not over	September, 1952	April, 1958	September, 1952	April, 1958
12 cwts.	1 ton	..	..	—	1
1 ton	2 tons	..	..	—	3
2 tons	2½ tons	..	13	1	11
2½ tons	3 tons	7	41	8	34
3 tons	5 tons	32	79	30	66
5 tons		..	98	79	90

VI. THE USE MADE OF THE VEHICLES

25. The following table shows the proportions of the vehicles in the sample not running on the public roads at all during the week 21st to 27th April. This includes vehicles engaged for the whole week on sites not on the public roads. Those which ran to and from such sites were treated as active and the mileage covered on the public roads included in the subsequent tables. The proportion of all vehicles in the sample not running on the public roads was 10·5 per cent.

Table 5

Vehicles in the sample not running on the public roads(¹)

Per cent

Unladen weight		"A" licence	Contract "A" licence	"B" licence	"C" licence
Over	Not over				
	12 cwts.	..	..	..	18·1
12 cwts.	1 ton	..	..	..	9·2
1 ton	2 tons	11·0	..	11·0	9·6
2 tons	2½ tons	6·2	17·0	13·1	10·1
2½ tons	3 tons	5·3	12·1	11·8	10·4
3 tons	5 tons	5·3	7·8	9·7	13·2
5 tons		7·6	12·6	..	16·1

(¹) Idle for repairs or for other reasons or working wholly on sites off the roads.

(*a*) *Operating Statistics: the units of measurement*

26. The statistics employed in this report to measure the use made of the vehicles are the number of miles run, the number of ton miles of work performed and the number of tons carried during the week covered by the enquiry.

27. These are the three best measures of vehicle usage and they are those which can be most easily compiled from the kind of information which operators are able to supply. They give very useful indications of the dimensions of the traffic which is being carried by road, but each has its weaknesses. Vehicle mileage gives an indication, for example, of the amount of use being made of the roads by goods vehicles, although in the aggregate it does not reflect differences in vehicle size or loadings. It is important to know the number of tons carried by road, and the quantity and variety of freight moved by road show how ubiquitous this form of transport is. Many types of goods, however, are not normally measured by weight and their weights have to be estimated. Moreover the number of tons carried, as a measure of work done, ignores the element of distance.

28. Ton mileage, that is the weight of each load multiplied by the distance it is carried, is a unit of measurement which reflects both weights and distances. It is in some ways, however, more significant for heavy goods which fill vehicles to their weight capacities than for goods which are light but bulky and which therefore fill the available space in a vehicle before it is loaded to its carrying capacity in terms of weight. This sort of load is particularly common in road transport, so much of whose traffic consists of highly finished goods, in contrast with, say the railways, about three quarters of whose ton mileage consists of coal and minerals. Nevertheless the ton mile remains the best single statistical unit with which to attempt to measure all the variety of traffics passing by road, and the only one which permits a genuine comparison with other forms of transport.

29. It must be emphasised that one of the chief features of road goods transport is its immense variety and complexity. Carriers, both for hire and on own account, have adapted their vehicles and their patterns of activity extremely closely to the varied needs of industry and trade, and there are almost as many sorts of road transport work as there are kinds of economic activity in the country. The statistics of this report are an attempt to measure what is measurable in road transport: they should not obscure the underlying complexity.

(b) Vehicle miles run

30. The statistics of the number of miles run given in this report include empty mileage and mileage run on the public roads when passing to and from sites not on the roads: as far as possible site work not on the public roads, for instance within factories or quarries, was excluded from all the following statistics.

Table 6

Average weekly vehicle mileage

Number

Unladen weight Over	Not over	"A" licence	Contract "A" licence	"B" licence	"C" licence
	12 cwts.	..	..	..	109
12 cwts.	1 ton	..	..	..	171
1 ton	2 tons	222	..	182	196
2 tons	2½ tons	250	299	199	202
2½ tons	3 tons	402	457	325	313
3 tons	5 tons	542	565	443	399
5 tons		703	741	..	522

31. The main features of table 6 are familiar. The lighter vehicles only run small weekly mileages, but the larger ones cover very much greater distances. The "B" and "C" licence figures are not very different although there is a suggestion that in the heavier categories the type of work performed on an average by "B" licence vehicles may begin to diverge from that under "C" licences, and involves greater weekly mileages. Vehicles with "A" and Contract "A" licences on the other hand perform work which leads to much greater average weekly mileages per vehicle than those of the same unladen weight with "B" or "C" licences.

Table 7

Proportion of vehicle mileage run loaded and empty

Per cent

		"A" licence	Contract "A" licence	"B" licence	"C" licence
Loaded over 50 per cent					
Unladen weight					
Over	Not over 12 cwts.	..	..	..	17
12 cwts.	1 ton	..	..	..	23
1 ton	2 tons	42	..	34	33
2 tons	2½ tons	44	46	42	39
2½ tons	3 tons	57	49	49	44
3 tons	5 tons	62	53	48	47
5 tons		74	55	..	54
Loaded not over 50 per cent					
Unladen weight					
Over	Not over 12 cwts.	..	..	..	60
12 cwts.	1 ton	..	..	..	50
1 ton	2 tons	36	..	32	44
2 tons	2½ tons	34	20	24	38
2½ tons	3 tons	20	15	16	28
3 tons	5 tons	12	5	9	21
5 tons		8	6	..	17
Empty					
Unladen weight					
Over	Not over 12 cwts.	..	..	..	23
12 cwts.	1 ton	..	..	..	27
1 ton	2 tons	22	..	34	23
2 tons	2½ tons	22	34	34	23
2½ tons	3 tons	23	36	35	28
3 tons	5 tons	26	42	43	32
5 tons		18	39	..	29

32. Table 7 was compiled by aggregating the figures of vehicle mileage given by operators on their returns as having been run while loaded over 50 per cent of the vehicle's carrying capacity in terms of weight, loaded to not more than 50 per cent and empty. The aggregates for each category were then expressed in percentage terms.

33. It is important to note that the figures are in respect of the capacity of the vehicles in terms of weight: light but bulky goods may fill all the available space in a vehicle without filling it to its weight capacity. Similar circumstances may arise with goods of which only small quantities can be placed in a vehicle, perhaps because the articles cannot be packed one on top of another.

34. The picture given by table 7 is one in which the smaller vehicles have a part load more often than a full one. The larger vehicles, on the other hand, tend to be fairly fully loaded or empty. The larger "C" licence vehicles show a rather larger proportion of empty mileage than "A" vehicles but a smaller proportion than either "B" or Contract "A" vehicles.

(c) *Ton miles of work*

35. The ton mileages of work performed by each vehicle were estimated from the information given on the returns obtained from operators. Separate calculations were generally made for each journey or for each day's work. In the case of trips which consisted of carrying a single load to a single destination the tonnage carried was multiplied by the loaded mileage. This type of work has for convenience been termed "end to end".

36. In the case of trips on which goods were picked up or set down at several points, which have been labelled "intermediate" journeys, a convention was adopted. The mileage run loaded over 50 per cent of the weight capacity was multiplied by a tonnage midway between the maximum load at any point on the journey and half the vehicle's carrying capacity. The mileage run loaded not over 50 per cent of the weight capacity was multiplied by one quarter of the carrying capacity. This method assumes a steady and continuous rate of setting down or picking up throughout the journey. A number of the forms received were sufficiently detailed to enable the validity of this assumption to be checked and it was found that while on some trips the convention led to an underestimate of the ton mileage it worked satisfactorily when applied over a number of journeys. Any errors of observation which may exist, however, in the estimates of ton mileages are probably in a conservative direction.

37. Only about 30 per cent of the vehicles were wholly engaged in intermediate work, however, representing a smaller proportion of total ton mileage, so that the convention is not of major importance in determining the total volume of work.

38. In the case of journeys on which returned empties were picked up allowances were made in the calculations of ton mileage on the basis of information contained in the forms and by making further enquiries of operators.

39. The enquiry did not attempt to obtain all the information required for the calculation of ton mileage for vehicles of not over 1 ton unladen weight. Experience has shown that operators of these vehicles have particularly serious difficulty in providing the necessary information. The ton mile is in any case not a very realistic unit with which to measure the work done by these small vehicles.

40. Ton mileage performed by articulated units is included but that of draw bar trailers is excluded. Ton mileage by the latter amounted to about 5 million in the week.

Table 8

Average weekly ton mileage

Number

Unladen weight		"A" licence	Contract "A" licence	"B" licence	"C" licence
Over	Not over 12 cwts.	..	..	..	..
12 cwts.	1 ton	..	..	..	..
1 ton	2 tons	152	..	81	70
2 tons	2½ tons	406	612(1)	291	239
2½ tons	3 tons	1,343	1,319	840	637
3 tons	5 tons	2,590	2,383	1,512	1,212
5 tons		6,308	5,180	..	3,037

(1) Margin of error large.

41. The chief features of table 8 are the very large increases of ton mileage with the size of vehicle, the excess of the figures for "A" licence vehicles over those for "C" vehicles of corresponding unladen weights and the suggestion that "B" licence work approximates more closely to "C" work than to that of corresponding "A" vehicles. These points will be examined at greater length in the section dealing with operation under each type of licence.

(*d*) *Tons of goods carried*

42. The tonnages of goods carried by each vehicle in the sample week were estimated from the information given by operators on their returns, supplemented where necessary by conversion factors for goods such as furniture and livestock not generally measured by weight. In some cases it was difficult to estimate the tonnages of goods carried, the usual reason being that the operator concerned had not given full information about each journey. Each form was carefully scrutinised and such internal evidence as it contained was made use of to help in arriving at the best possible estimate, but there is generally a wider margin of uncertainty about this statistic than is the case in respect of the vehicle mileage or ton mileage.

Table 9

Average weekly tonnage carried

Number

Unladen weight		"A" licence	Contract "A" licence	"B" licence	"C" licence
Over	Not over 12 cwts.	..	..	..	..
12 cwts.	1 ton	..	..	..	..
1 ton	2 tons	18	..	13	4
2 tons	2½ tons	36	41	46	20
2½ tons	3 tons	44	66	74	38
3 tons	5 tons	62	103	97	59
5 tons		60	113	..	71

43. Several factors affect the tonnage figures of table 9. The larger vehicles are capable of carrying heavier loads at each trip, but being more often engaged on long haul work may not make so many trips in a week. These influences tend to counterbalance one another.

44. The largest category of "C" vehicles lifts on an average a greater tonnage in a week than the corresponding "A" licence category, probably for the same reason. The nature of goods carried plays a big part: the comparatively large tonnages carried by "B" licence vehicles may partly reflect the importance of coal deliveries in these vehicles' work.

VII. FEATURES OF OPERATIONS BY VEHICLES OF EACH TYPE OF LICENCE

(a) Vehicles on "A" licences

45. The enquiry covered all types of vehicles operated on "A" licences, including the British Transport Commission's British Railways and British Road Services' vehicles and all vehicles with Special "A" licences. The chief features of "A" licence operation are the predominance of work in which a load was carried intact to a single destination, and the long hauls. The following table shows that only a comparatively small proportion of the heavier "A" licence vehicles are wholly engaged in "intermediate" type work which involves many stops on each journey to set down and pick up goods.

Table 10

Proportion of vehicles wholly engaged in "intermediate" work

Per cent

Unladen weight		"A" licence	"C" licence
Over	Not over		
2 tons	2½ tons	46	49
2½ tons	3 tons	30	37
3 tons	5 tons	11	20
5 tons		2	7

46. The estimates of the average lengths of haul of all vehicles in an unladen weight/licence category are subject to wide margins of error but the following table shows the much longer average hauls of "A" vehicles compared with the corresponding "C" categories.

Table 11

Average lengths of haul(1)

Miles

Unladen weight		"A" licence	"C" licence
Over	Not over		
3 tons	5 tons	34– 51	17–26
5 tons		90–121	33–55

---

(1) The figures given represent the ranges within which the average lengths of haul probably lie.

47. The long average hauls and the small proportion of "intermediate" work, together with the large average carrying capacity shown in table 2 make it possible for the heavier "A" licence vehicles to perform large ton mileages in a period. If a comparison is made between the average ton mileages of table 8 and weighted averages of the figures for "A" licence vehicles and the Road Haulage Executive vehicles at the time of the enquiry carried out in 1952, it appears that there have been increases in respect of the larger vehicles of between one third and one sixth. Since 1952 there have been four changes in circumstances which may have contributed to these increases. In the first place the radius restrictions imposed on many "A" licence operators as a result of the Transport Act, 1947, have been removed, thus allowing a fuller use of vehicles. Secondly, a substantial proportion of British Road Services' vehicles have been sold to other operators. Thirdly the speed limit on vehicles of over 3 tons unladen weight has been raised from 20 miles per hour to 30 miles per hour, which should allow vehicles to cover greater mileages in a day. In the latter connection it is interesting that the mean ton mileages of "C" licence vehicles of over 5 tons also show an increase compared with 1952, whereas the 3 to 5 ton group shows no significant change, possibly due to the offsetting effect of slack trade in 1958 and a large increase in the numbers of these vehicles during the intervening period. In the fourth place there has been an increase of about 8 per cent in the average carrying capacity of the "A" vehicles of over 5 tons unladen weight.

48. It is not possible to evaluate the contributions of these four changes but in total there seems to have been a substantial rise in the average amount of work done by the large vehicles operated for hire.

(b) Vehicles on Contract "A" licences

49. Vehicles operated on Contract "A" licences may only be used on a contract (extending over a continuous period of not less than one year) made by the holder with some person other than a carrier for the exclusive carriage of that person's goods in connection with his trade or business. Hence these vehicles are under the close and exclusive operational control of the traders whose goods they are carrying. In this respect these vehicles resemble "C" licence vehicles rather than those with "A" licences although the owner may regard himself as a haulier. The general nature of the work performed by Contract "A" vehicles, however, differs substantially from "C" work. On the whole traders only appear to employ Contract "A" vehicles when their business generates substantial volumes of traffic giving high weekly mileages and ton mileages.

50. It is interesting to note from table 7 that a substantial proportion of Contract "A" mileage is run empty. There appears to be a contrast here with "C" licence work: "C" vehicles run smaller weekly mileages than the corresponding Contract "A" vehicles but appear to have a load for a bigger proportion of their time.

51. The number of Contract "A" vehicles has increased substantially in recent years. In September, 1952, there were 13,005 vehicles of which 3,272 were of over 3 tons unladen weight. In June, 1958, there were 25,433 of which 11,736 were of over 3 tons unladen weight.

(c) Vehicles on "B" licences

52. Vehicles operated on "B" licences can be used for the carriage of goods in connection with the operator's own business and, subject to restrictions, for the carriage of goods for hire or reward.

53. The tables of weekly mileages, ton mileages and tonnages show that the work of "B" licence vehicles differs in certain respects from that of the corresponding categories of both "A" and "C" licence vehicles. The average ton mileage per vehicle per week is greater than that of the "C" vehicles of the same unladen weight but much smaller than that of the equivalent "A" licence vehicles. This does not appear to be due to a simple admixture of a certain amount of work for hire. The "B" licence vehicles show remarkably high proportions of empty running, in excess of the "C" licence figures as well as of the proportions shown by "A" licence vehicles (see table 7).

54. The high average tonnages shifted per vehicle when taken in conjunction with the ton mileage figures show that the average hauls are short, shorter even than those for the corresponding "C" vehicles. The restrictions imposed on "B" licence vehicles may be largely responsible: the radius restrictions limit the lengths of haul on which the vehicles can operate and the restrictions on the nature of goods which can be carried for hire must reduce the chances of getting balancing loads.

55. It was not known what proportion of "B" licence work was performed on own account and what proportion for hire. In order to throw some light on this a small sub-sample of 242 vehicles was chosen at random from the forms obtained from "B" licence operators in the main enquiry. An attempt was then made to divide the work of the vehicles in this sub-sample between for hire and on own account by a careful comparison of their week's work with the nature of the operator's main business and the wording of the restrictions applicable to their operations for hire, as set out on the operators' licences. On the whole this made the allocation of work fairly straightforward although some operators are licensed to carry for hire goods very similar to those they might be expected to carry in connection with their main businesses. The following table shows the proportions of the tonnage carried by the vehicles in the sub-sample on own account and for hire.

Table 12

"B" licence work

Per cent

Unladen weight		Proportion of tonnage carried on own account	Proportion of tonnage carried for hire
Over	Not over		
1 ton	2 tons	58	42
2 tons	3 tons	39	61
3 tons	5 tons	28	72

56. The overall proportion of total tonnage carried on own account appeared to be about one third, the remaining two thirds being carried for hire. This was, however, a very small sub-sample and the results are subject to particularly wide margins of error. Moreover, a major feature of "B" licence work is the seasonal nature of much of it and it is highly likely that the intensity of use of the vehicles, the nature of goods carried and the proportion carried on own account would be very different at other times of the year.

(d) Vehicles on "C" licences

57. The information obtained in the enquiry can be drawn upon to illustrate the nature of the work being done by "C" licence vehicles, and the statistics of vehicle operation throw a good deal of light on the factors which influence the amount of work which individual vehicles can perform.

The nature of work

58. The large numbers of "C" licence vehicles engaged on retail delivery work is well known. Table 13 shows the proportions of vehicles in the sample engaged in carrying the principal types of goods. About two-thirds of the vehicles of not over 2 tons unladen weight were carrying foodstuffs and groceries, electrical goods and miscellaneous manufactures. There were 760,000 "C" licence vehicles of this size in June, 1958.

Table 13

Proportion of small "C" licence vehicles in the sample engaged wholly in carrying certain goods

Per cent

	Not over 1 ton unladen weight	Over 1 ton not over 2 tons unladen weight
Groceries, fish, etc., meat, fruit, vegetables, milk, potatoes and other agricultural products.	34	38
Metals and metalwork (including sanitary, plumbing, heating and lighting fixtures mainly of metal), hardware.	5	3
Machinery and electrical apparatus (including wireless and television sets, motor car parts, instruments).	22	11
Manufactured goods not included elsewhere (cloth, clothing, footwear, glass, pottery, fancy goods, paper, newspaper, laundry).	9	15
Total of above	70	67

59. The nature of the goods carried by the larger "C" licence vehicles will be examined in the section dealing with the commodities carried by road. Here it is worth stressing that a good deal of the traffic of the medium weight and heavy "C" licence vehicles was performed on hauls of appreciable length. For example, the average length of haul of "C" vehicles of 3 to 5 tons unladen weight was probably between 17 and 26 miles but about half a million tons per week were carried by vehicles with average hauls of over 40 miles. In total, "C" licence vehicles of all sizes probably carried nearly 1½ million tons a week on hauls of more than 40 miles, out of a total traffic passing over these distances of rather under 3½ million tons.

The operating statistics

60. It is sometimes suggested that " C " licence vehicles perform their work in a manner which is in some sense "inefficient" or "wasteful" when compared with operations by vehicles plying for hire. It may be useful to see whether the statistics which have resulted from the present enquiry would support a

general statement about comparative efficiencies of operation. Table 14 below compares the average vehicle mileages and ton mileages per week of "C" and "A" licence vehicles.

Table 14

Comparison of certain operating statistics

Number

		Average vehicle miles per week		Average ton miles per week	
		"A" licence	"C" licence	"A" licence	"C" licence
Unladen weight					
Over	Not over				
2 tons	2½ tons	250	202	406	239
2½ tons	3 tons	402	313	1,343	637
3 tons	5 tons	542	399	2,590	1,212
5 tons		703	522	6,308	3,037

61. The figures show that "C" vehicles tend on an average to be less intensively used, when intensity of use is measured by the vehicle mileage or ton mileage performed in a period of time. It must be stressed that these figures are only averages and in many instances individual "C" licence vehicles will be running many more miles per week than considerable numbers of "A" licence vehicles of the same size. For example, among the vehicles of over 5 tons unladen weight over 30 per cent of the "C" vehicles ran more miles in the week than the average figure for the "A" vehicles. Hence it would in any case be dangerous to base very positive statements on the averages of table 14.

62. Moreover, further examination of the data shows that there are other important considerations which should be taken into account when making comparisons of this kind. There are at least three major influences at work.

63. In the first place there are two very different types of work that vehicles may engage in. A vehicle may be setting down or picking up goods at several points during a journey. For convenience this is termed "intermediate" work. Alternatively a vehicle may carry a load from a single picking up point to a single destination, and this has been termed "end to end" work. Vehicles which performed some work of each kind were classified as engaged in "mixed" work. Vehicles of a given size and carrying the same commodity will, when engaged in "end to end" work, show higher weekly mileages and ton mileages and higher load factors than will be the case when running on "intermediate" trips. This is partly because less time will be taken up in loading, unloading and waiting. Moreover, a vehicle which is picking up or setting down at a number of points cannot be fully loaded for more than a comparatively small proportion of its time. This reduces the load factor, which in turn adversely affects the ton mileage performed. The effect is considerable, as can be seen from the following table 15.

Table 15

Effect of nature of work on the operating statistics:
"C" licence vehicles of over 2 not over 3 tons unladen weight with average hauls of 20 and under 30 miles(¹)

Number

	Average load (tons)	Ton miles per vehicle per week
On "intermediate" work .	1·3	332
On "mixed" work . .	1·8	566
On "end to end" work .	2·3	671

(¹) The object of confining this table to the particular batch of vehicles which it covers was to eliminate the effect of other influences.

64. The enquiry showed that whatever size of vehicle is considered, even the largest, the proportion of vehicles on work of an "intermediate" nature was substantially larger among "C" licence vehicles than among those with "A" licences and the disparity increases with the size of vehicle. The figures are given in table 10. Hence the averages of table 14 for "C" licence vehicles are depressed by the comparatively large proportion of vehicles engaged in "intermediate" type work in which it is not possible to achieve the same intensity of use as is feasible in "end to end" trips.

65. The second important factor underlying the figures of table 14 is the average length of haul. The estimates of average lengths of haul given in table 11 show the extent to which vehicles operated for hire are engaged in longer distance work than vehicles of the same size on "C" licences. The following table, which is confined to a circumscribed group of vehicles in order to eliminate other influences, shows the importance of this factor.

Table 16

Effect of length of haul on operating statistics:
"C" licence vehicles of over 3 not over 5 tons unladen weight carrying certain commodities(¹)

Number

	Average hauls of vehicles		
	Not over 20 miles	Over 20 not over 40 miles	Over 40 miles
Average weekly vehicle mileage			
On "end to end" work . .	344	464	697
All types of work	315	432	644
Average weekly ton mileage			
On "end to end" work . .	957	1,541	2,273
All types of work	846	1,265	2,172

(¹) Commodity groups 8, 9 and 10 of the classification set out on page 23.

66. These figures show that when all other major factors are excluded the length of haul exercises a very substantial influence on the amount of work

which a vehicle can do in a period of time, as measured by the mileage it will cover and the ton mileage it will perform. The average hauls may play a major part in accounting for the differences of table 14: table 16 shows that for the vehicles covered the average ton mileage per week was over twice as great for those on hauls of over 40 miles as for those on hauls of less than 20 miles, while table 11 shows that the average lengths of haul for the two heaviest categories of "A" licence vehicles are roughly twice as long as those for the corresponding "C" vehicles. Briefly, other things being equal, longer hauls mean many more ton miles.

67. The third major factor underlying the figures of table 14 was the differences in average carrying capacity of the vehicles. The figures of table 2 show that the average carrying capacities of "A" licence vehicles in the 2½ to 3, 3 to 5 and over 5 tons unladen weight groups were 13, 21 and 25 per cent respectively in excess of the corresponding "C" vehicles. These differences may have been partly due to a tendency for a larger proportion of "C" vehicles to be fitted with special types of body to adapt them for particular purposes.

68. There may be a further influence at work: the nature of the goods carried will affect the loads of vehicles and hence will raise or depress the ton mileage which will result from a given vehicle mileage. Insofar as "C" licence vehicles are used to move the more highly manufactured goods or other types of goods generally occupying a large volume of space in relation to their weight, their average loads in terms of weight will be depressed. The sample was too small to show whether this factor had an important effect on the figures of table 14.

69. To sum up, the statistics set out in table 14 appeared at first sight to indicate that vehicles operated under " C" licences are less intensively used than those operating under "A" licences and that they are consequently in some sense "inefficient". Further examination, however, corrects this impression. The comparatively low average vehicle mileages and ton mileages are largely the result of a number of influences which are inherent in the nature of the work which these vehicles are performing. Hence it is not possible to compare efficiencies by comparing figures of vehicle mileage, ton mileages or load factors. The dominant influence is the type of operation, and many criticisms of "C" licence operation appear to be based on a misunderstanding of this. The information obtained by this enquiry provides no evidence of inefficiency in "C" licence operation.

70. A conclusion may be drawn from this detailed examination of "C" licence operation which is applicable to the interpretation of almost all operating statistics covering a wide variety of vehicles and work. An individual operator of a fleet of vehicles engaged in work all of which is of a fairly similar nature may regard the vehicle mileage or ton mileage performed in a period as a good indicator of the efficiency with which his fleet is managed. Similarly the average loads might give a guide to the extent to which the carrying capacity of the vehicles was being utilised. While this approach is often valuable in respect of small fleets it is clear from the above examination that conclusions on matters of this kind cannot be drawn from figures relating to a large number of vehicles performing a wide variety of types of work. The effect which any differences in managerial competence may have will be swamped by variations due to the nature of the work which vehicles are performing.

71. There is another reason for doubting whether centrally collected statistics can be fairly used as a basis for judgments about the "efficiency" with which

large numbers of vehicles are operated. Such statistics cannot indicate how well the services which the vehicles provide suit the needs of the users. For example "C" licence operations are extremely varied, having clearly been adapted to the particular needs of individual firms at particular times and in respect of particular consignments in all manner of special circumstances. No statistics of the operation of the vehicles can measure the extent of the resulting economies and advantages which accrue to the users at other stages of the process of production and distribution. Gains of these kinds will be taken into account by firms when deciding whether to operate vehicles on own account or not, but these advantages will not be reflected in and cannot be measured by statistical or other information relating to transport.

VIII. THE COMMODITIES CARRIED

72. Table 17 below gives estimates of the quantities of certain broad categories of goods which were carried by road during the week covered by the enquiry. For technical reasons these estimates are subject to wide margins of error. Moreover, there are two other considerations which have to be borne in mind in interpreting them. The slack state of trade in the early part of 1958 may have affected some sectors of the economy more than others so that the total quantity of goods may be less than it would otherwise have been and the various traffics may not stand in the same relationship to one another as they would at a time of brisk economic activity. Secondly, there may be marked seasonal fluctuations in the quantities of certain goods carried, so that the figures of table 17 should not be taken as necessarily applying to a full year.

73. No attempt could be made to calculate the tonnages of different goods carried by the smaller vehicles of under 2 tons unladen weight and these are not covered by the table although they are numerous and in the aggregate move a substantial quantity of traffic. The figures of table 17 therefore differ from those of table 20.

Table 17

Estimated quantities of goods carried during the sample week by all vehicles over 2 tons unladen weight

Thousand tons

	"A" licence	Contract "A" licence	"B" licence	"C" licence	Total
Commodity groups					
1 to 7 . . .	928	155	413	2,859	4,355
8 and 16 . . .	181	26	120	500	827
9	366	84	91	641	1,182
10	783	743	1,583	3,504	6,613
12	287	330	842	1,122	2,581
11, 13 and 14 . .	292	229	151	785	1,457
15 and 17 . . .	452	70	50	749	1,321
Others . . .	766	129	413	692	2,000
Total . . .	4,055	1,766	3,663	10,852	20,336

Commodity classification

Group

1. Groceries, fish, etc. (groceries, bread and confectionery, fish, eggs, school meals, etc.).
2. Meat, and animal products.
3. Fruits and vegetables, flowers.
4. Fresh milk and cream, milk powder.
5. Live animals.
6. Other agricultural produce and requirements (grain, potatoes, flour, beet, feeding stuffs for animals, linseed oil).
7. Beverages and tobacco.
8. Wood, lumber and cork (including manufactures other than furniture).
9. Metals and metalwork (including girders, castings, ingots, sanitary, plumbing, heating and lighting fixtures and fittings if mainly of metal), hardware.
10. Building and constructional materials (excluding iron and steelwork, timber, sanitary, plumbing, lighting and heating fixtures and fittings): including sand, gravel, cement, bricks, slates, tiles, rubble and hardcore.
11. Other crude materials not elsewhere specified (including leather, rubber, fibres, china clay, wood pulp).
12. Coal, coke and patent fuels.
13. Petroleum, oils, lubricants and related materials.
14. Chemicals and chemical products (including manufactured fertilisers, plastics, paint, lime).
15. Machinery (including electrical apparatus, wireless and television sets, motor car parts, instruments).
16. Furniture.
17. Manufactured goods not elsewhere specified (cloth, clothing, footwear, glass, pottery, fancy goods, paper, newspaper, laundry).
18. Unallocated (homogeneous loads).
19. Unallocated (mixed loads).
20. Residuals and not known.

Note :—associated empties are included with goods.

74. The classification of goods adopted, which is set out above, was based primarily on the Standard International Trade Classification, modified in some ways in the light of experience gained in the previous enquiry. It was believed that it is better to have a classification based on the nature of the goods themselves rather than on the industries to and from which they are moving. A classification of the latter kind is useful when considering the question of which industries generate traffic, but in practice is very difficult to apply. The whole problem of the classification of road freight is one which requires further study.

75. Building and civil engineering are clearly the pre-eminent generators of road traffic. Tonnages of building materials, etc. made up at least one third of the total. This proportion understates the true position, because, in the classification of freight used, sanitary, plumbing and lighting fittings were included with metals and metalwork, while all wood and timber was included in a separate heading.

76. Foodstuffs, groceries and farm produce and requirements are the second most important group, accounting for rather over one-fifth of the total tonnage in the sample week. It is likely that the share of this group would be larger at times when heavy crops are moving off the farms.

77. The third important commodity group was coal and coke, making up about an eighth of the total. This proportion also may be very different at other times of the year. A good deal of the traffic consists of deliveries to domestic users.

78. These three groups together made up about two-thirds of the total tonnages moved in the sample week. The quantities of other goods carried, however, are very substantial and would amount in a full year to a total in the region of 300 million tons.

IX. THE VOLUME OF TRAFFIC

(a) *During the sample week*

79. The numbers of vehicles in the fleet, as set out in table 1 were reduced by the proportions of table 5, in order to exclude those not running on the public roads during the week, and then multiplied by the average ton mileages of table 8 to produce estimates of the total ton mileage performed by all vehicles in the week. These are set out in table 18 below. The corresponding aggregate tonnages, compiled in the same way, are set out in table 20.

Table 18

Estimated aggregate ton mileage by all vehicles in the sample week(1)

Millions

		"A" licence	Contract "A" licence	"B" licence	"C" licence	Total
Unladen weight						
Over	Not over					
	2 tons	0·6(2)	0·2(2)	0·6(2)	22·3(2)	23·7
2 tons	3 tons	49·1	12·2	25·8	95·6	182·7
3 tons		131·8	33·5	21·4(2)	120·0	306·7
Total . . .		181·5	45·9	47·8	237·9	513·1

(1) In addition about 5 million ton miles of work were performed by trailers.

(2) Includes estimates for unsampled cells.

80. Comparisons with the previous enquiry carried out in respect of one week in September, 1952, can only be made with extreme caution. Apart from the margins of error introduced by sampling errors there are further sources of uncertainty. The enquiry conducted in 1958 was held at a different time of the year from that of 1952 and little is known of the seasonal patterns of traffic of the various categories of vehicles. Moreover, in 1958 some trades and industries were slack while others were active. Vehicles serving industries not working at full capacity may have depressed the total quantities of work performed by categories of which they normally do a large part of the work. For example the fall in building activity may help to account for the reduction in relative importance of the "C" licence vehicles of over 2 not over 3 tons unladen weight. In addition the estimates published for the traffic during the sample week of 1952 excluded the work of tankers, which are included in the figures of all tables in this report. Nevertheless it appears safe to make a few tentative comments on changes which have taken place since 1952.

81. In the first place there seems to have been a large increase in the quantity of "A" licence work. On a comparison of the sample weeks this appears to be of the order of three-fifths to one-half. It has been suggested above that a number of factors may have combined to produce this. In the first place there have been increases in the numbers of larger "A" licence vehicles, those of 3 to 5 tons unladen weight increasing since September, 1952 by one-third and those of over 5 tons by over two-fifths. There has, however, been no increase in the total number of vehicles. Secondly there has been an increase in the average carrying capacity of the vehicles of over 5 tons unladen weight. Thirdly there have been institutional changes: radius restrictions have been lifted, many vehicles have been denationalised and the 20 m.p.h. speed limit on heavy vehicles has been raised to 30 m.p.h.

82. A second feature which emerges from the comparison is the more than threefold increase in Contract "A" work. This has been largely in vehicles of over 3 tons unladen weight.

83. The increase in "B" licence work is apparently not so large but the figures are particularly difficult to interpret owing to the very seasonal nature of much "B" licence traffic. As with the other licence categories there appears to have been a shift upwards towards the heavier vehicles.

84. The increase in "C" licence traffic of very roughly one-fifth is substantial but perhaps not as great as might have been expected. Part of the explanation may lie in the extent to which certain sectors of the economy which normally generate a large quantity of " C " licence traffic were suffering from slack trade during 1958.

85. It is interesting to rearrange the figures of table 18 according to the distinction between transport for hire and on own account discussed in Section III. Taking Contract "A" work and one-third of "B" licence work as operation on own account in addition to "C" licence work the picture appears as follows:—

Table 19

Transport for hire and on own account

	Per cent of ton miles
For hire . . .	42
On own account .	58
Total . . .	100

86. The tonnage figures of table 20 cannot be compared with those of the previous enquiry owing to the exclusion from the 1958 figures of all traffic not operated wholly or partly on the public roads. This makes comparatively little difference to the ton mileage figures but has an appreciable effect on the tonnages carried. On short hauls in quarries, works, yards, etc. vehicles often shift large tonnages in a week but because the distances involved are not great they do not perform large ton mileages.

Table 20

Estimated aggregate tonnage carried by all vehicles in the sample week

Millions

Unladen weight Over	 Not over	"A" licence	Contract "A" licence	"B" licence	"C" licence	Total
	2 tons	0·1(1)	—(1)	0·1(1)	1·6(1)	1·8
2 tons	3 tons	1·9	0·6	2·6	6·3	11·4
3 tons		2·1	1·1	1·2(1)	4·6	9·0
Total . . .		4·1	1·7	3·9	12·5	22·2

(1) Includes estimates for unsampled cells.

(*b*) *During the year 1958*

87. It must be emphasised that the sample enquiry from which the above data were derived was based on one week in April, 1958. This week was chosen as being free from the effect of holidays. It was also reasonably intermediate between winter influences and the increase in industrial production which normally takes place in the late spring and early summer, and again in the autumn. Nevertheless the task of estimating the total volume of road traffic for the whole year from figures relating to this one week remains a difficult one.

88. A basis for making the estimate exists in the manual counts of road traffic conducted continuously at 50 points on the country's road system by the local highway authorities at the request of the Department. Fifty points were selected at random on the Trunk and other classified roads of Great Britain, and at these points a system of manual counts of the passing traffic was introduced, of such a nature that monthly estimates can be made of changes in the vehicle mileage of each of the major categories of vehicles on these roads. Such vehicle mileage makes up a very large proportion of the total vehicle mileage on all the British roads, and there appears no reason to suppose that the vehicle mileage on other roads fluctuates in a very different pattern. Hence these 50 point counts can be taken as indicating variations in the total volume of traffic on the roads. Separate figures are obtained for goods vehicles, divided between the light vans on motor car type bodies (vehicles of not over 30 cwts. unladen weight) and the larger vehicles.

89. Special counts were carried out during the week of the sample enquiry which made it possible to link the traffic in the period with that for the month and the year. The figures obtained from the sample were grossed up in the proportion which the counts in the sample week bore to those for the twelve months. There are weaknesses in this procedure but it is thought that it permits a fairly close estimate of the year's total.

Table 21

Goods transport by road

1958

Tons carried (millions) . .	1,000
Ton miles (thousand millions)	23·1

(*c*) *Comparison with other forms of transport*

90. In order to put the figures of table 21 into their proper perspective it is necessary to set them beside statistics of the traffic of the other means of domestic transport in 1958. The following table sets out the best estimates which can be made.

Table 22

Domestic goods transport, 1958

	Tons carried(1)	Ton miles	Proportions of the total	
	Millions	Thousand millions	Tons	Ton miles
			Per cent	
Road	1,000	23	76	45
Rail	260(2)	18	19	35
Inland waterway	10	—	1	—
Coastal shipping	50	10(3)	4	20
Total	1,320	51	100	100

(1) To the nearest 10 millions.
(2) Includes freehauled traffic.
(3) Inland equivalent.

91. A comparison of inland goods traffic in 1958 with that of 1952 is of interest and is given in table 23.

Table 23

Inland goods transport

1952 and 1958

	Thousand million ton miles		Per cent of ton miles	
	1952	1958	1952	1958
Road	18·8	23·1	46	56
Rail	22·4	18·3	54	44
Total	41·2	41·4	100	100

92. There was an increase of nearly one-quarter in the quantity of goods carried by road. The railway figures for 1958 in tables 22 and 23 are depressed largely owing to the decline in iron and steel production and the fall in the consumption of coal. This has also reduced the total volume of inland goods traffic to a level little higher than that of 1952. Nevertheless even when allowance is made for these special circumstances in 1958 it is clear that whatever unit of measurement is used road transport is now the major means of inland carriage of goods.

X. SUMMARY

93. The main points that emerge from the survey may be summarised as follows:—

(*a*) The greater part of inland goods traffic now goes by road: the proportion of total inland ton mileage passing by road in 1958 was about 56 per cent.

(*b*) Since 1952 the total volume of road goods traffic has increased by nearly one-quarter. There have been substantial increases in the traffic carried by vehicles operated on each type of licence.

(*c*) There has been an increase since 1952 in the average intensity of use of large vehicles operated for hire.

(*d*) A detailed examination of "C" licence operation shows the special nature of the work of these vehicles: there is no evidence that the vehicles are being operated inefficiently.

(*e*) The enquiry gives some detailed information about the operation of the various categories of goods vehicles and about the nature of the traffic being carried.

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